

## **BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Study**

**Region:** Pacific

**Planning Area(s):** Hawaii

**Title:** A Marine Biogeographic Assessment of the Main Hawaiian Islands  
(PC-13-06)

**BOEM Information Need(s) to be Addressed:** There is increasing interest in the development of offshore renewable energy projects off the coast of the main Hawaiian Islands (MHI). The University of Hawaii and the Natural Energy Laboratory of Hawaii have expressed interest in obtaining OCS research leases offshore Oahu and Hawaii, and BOEM has received unsolicited requests for wind leases offshore Oahu. In addition, BOEM is a Cooperating Agency in a programmatic EIS for the “Hawaii Interisland Renewable Energy Program (HIREP): Wind” that includes analysis of a potential OCS subsea power cable for inter-island energy transmission. While BOEM has completed more than 300 studies in the Pacific, none of these has addressed resources around the MHI. BOEM needs an assessment of available baseline information on a variety of biological and physical resources offshore of the MHI to determine knowledge gaps and study needs, and assess what information is available to conduct environmental analyses and inform the decisionmaking process for the review of offshore renewable energy project submittals. A marine biogeographic assessment of the MHI will expand BOEM’s assessment capabilities, define study needs, and contribute greatly toward ecosystem-based management of the marine resources of the MHI.

**Total BOEM Cost:** \$500,000

**Period of Performance:** FY 2013-2015

**Conducting Organization:** NOAA

**Principal Investigator:** Chris Caldow

**BOEM Contact:** [Greg Sanders](#)

### **Description:**

Background: Defining biogeographic patterns off the MHI is an effective way to synthesize existing information about biological and physical resources. A marine biogeographic assessment will assemble and synthesize readily available existing georeferenced data describing the physical oceanography, and the distribution and abundance of benthic habitats, cetaceans, seals, seabirds, reptiles, fish, and invertebrates (including corals) in the MHI. Collectively, these GIS datasets would be used by BOEM to understand what information exists on the marine resources found within state and federal waters, identify knowledge gaps, and inform renewable energy siting and development in and around the MHI.

The study will include broad-based characterization of the physical and biological environments (e.g., oceanography and benthic habitats) that structure the spatial and temporal distribution of living marine resources off the coast of the MHI. Readily available existing information on the

distribution of living marine resources, including key species of interest identified by BOEM staff, will be integrated with available biophysical information using various spatial analysis techniques. We expect this study to be awarded through an Interagency Agreement with NOAA, who has produced similar biogeographic assessments for other regions including the Northwestern Hawaiian Islands.

Objectives: Questions to be addressed in this study include:

- How are trophic groups, families, and species distributed spatially and temporally in the MHI?
- Where are ecologically unique and productive habitats located in the MHI?
- How are ecologically important areas being utilized by living marine resources?
- Where can offshore renewable energy projects (e.g., wind farms) be located to maximize energy production and minimize potential impacts to the marine environment?
- What significant gaps exist in our knowledge of the physical, biological and ecological characteristics of the MHI?

Methods: The specific tasks for this project include: (1) identification and acquisition of existing relevant, readily available physical, biological, and ecological datasets for the study area including information about benthic habitats, cetaceans, seals, seabirds, reptiles, fish, and invertebrates (including corals); (2) organization of data into a common spatial framework within GIS, and identification of information gaps in existing datasets and research activities; (3) synthesis of GIS data and development of maps depicting the spatial distribution of physical, biological, and ecological data sets for the study area; (4) biogeographic analysis of available data to identify ecologically significant regions, based on species distributions, abundances, associated benthic habitats, and other datasets, if appropriate; and (5) preparation of a report summarizing methods and key findings, including relevant maps, figures, tables, and appendices.

Readily available existing physical, biological, and ecological data sets will be obtained from groups actively working in the region (i.e., academic, government, consulting, nonprofit, and other groups). Relevant datasets will be formatted and organized into a preliminary database management system (DBMS) to assess their quality and content. Once the datasets have been formatted and organized, maps will be developed depicting the spatial distribution of the physical, biological, and ecological data. If the data allows, species abundances will also be mapped. The GIS data used to create these maps will be delivered to BOEM, along with metadata describing source, derivation, and limitations of each GIS data layer, when possible. The quality of the final maps will depend on the quality, quantity, and availability of data for analysis. Key ecologically important areas will be identified based on the following criteria: (1) the availability, completeness, and limitations associated with specific datasets; (2) maps denoting the distribution and abundance of specific species; and (3) the distribution of biophysical habitats. All data will be integrated into a spatially explicit index in an attempt to evaluate overall spatial patterns. A final report will be prepared describing key ecological patterns, linkages, and locations highlighted by the project's quantitative and qualitative analyses.

**Current Status:** An inter-agency agreement was signed on July 30, 2013 and a post-award meeting was held on September 17, 2013. Data is currently being collected and a draft web site has been created.

**Final Report Due:** August 2015

**Publications Completed:** None at this time.

**Affiliated WWW Sites:** <http://coastalscience.noaa.gov/projects/detail?key=163>

**Revised Date:** September 30, 2013